



**EXTENDED NATURAL GAS ANALYSIS (*DHA)
GLYCALC INFORMATION**

PROJECT NO. :	202508080	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 23, 2025 12:52
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 08, 2025 09:30
PRODUCER :		CYLINDER NO. :	ECA-815
LEASE NO. :		SAMPLED BY :	NICK COY
NAME/DESCRIP :	YCF 33-43-1 INTERMEDIATE CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	75	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	— ppm mol		
COMMENTS :			

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.04	0.09
Nitrogen	0.53	0.80
Methane	89.1513	76.8525
Ethane	6.2385	10.0800
Propane	2.2031	5.2202
Isobutane	0.4578	1.4298
n-Butane	0.5325	1.6631
Isopentane	0.1940	0.7521
n-Pentane	0.1597	0.6192
Cyclopentane	0.0068	0.0256
n-Hexane	0.0701	0.3246
Cyclohexane	0.0453	0.2048
Other Hexanes	0.0968	0.4481
Heptanes	0.1174	0.6303
Methylcyclohexane	0.0650	0.3429
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0037	0.0155
Toluene	0.0027	0.0134
Ethylbenzene	0.0005	0.0029
Xylenes	0.0013	0.0074
C8+ Heavies	0.0726	0.4748
<u>Subtotal</u>	<u>99.99910</u>	<u>99.99720</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0009	0.0028
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
LHV	Net Dry Real:	1027.5	4887.6	6081.2	8094.5 Btu/scf
	Net Wet Real:	1009.5	4802.2	5974.9	7953.0 Btu/scf
HHV	Gross Dry Real:	1136.4	5264.5	6549.4	8728.8 Btu/scf
	Gross Wet Real:	1116.5	5172.5	6434.9	8576.2 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1419.2	2872.9	3203.6	3719.0	Btu/scf
Net Heating Value (60 °F ideal reaction):	20987.8	19351.3	19628.3	18984.2	Btu/lbm
Gross Heating Value (60°F ideal reaction):	23209.8	20841.8	21140.4	20471.1	Btu/lbm
Molar Mass (MW):	18.61054	96.461	121.26	160.497	g/mol
Relative Density (AIR=1):	0.6417	3.3304	4.1873	5.5416	SG
Density:	0.04904	0.25418	0.31956	0.42294	lbm/scf
Compressibility Factor:	0.9974	0.9928	0.9978	0.9998	Z
Liquid Volume real gas @:	17.9965	0.1964	0.0319	0.003	gal/1000 scf

* The Wobbe pressure base in the number considered is based upon the given Pb of the HHV above.
 #DIV/0 or 0 (zero) will appear in the Calculated Value Section when there is no C6+, C8+ or C10+ in the sample to calculate these factors.
 BDL - Below Detection Limit. The H2S LOS has a detection limit of 0.25 ppm. A _ (an underscore) indicates there was no tube pulled for H2S.

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2-Methylhexane	I7	0.0143	0.0770	0.007	0.007
2,3-Dimethylpentane	I7	0.0038	0.0205	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0025	0.0132	0.001	0.001
3-Methylhexane	I7	0.0127	0.0684	0.006	0.006
1c,3-Dimethylcyclopentane	N7	0.0043	0.0227	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0039	0.0206	0.002	0.002
3-Ethylpentane	I7	0.0006	0.0032	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0063	0.0333	0.003	0.003
n-Heptane	P7	0.0358	0.1927	0.016	0.016
1c,2-Dimethylcyclopentane	N7	0.0006	0.0032	0.000	0.000
Methylcyclohexane	N7	0.0650	0.3429	0.026	0.026
2,2-Dimethylhexane	I8	0.0015	0.0092	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
Ethylcyclopentane	N7	0.0020	0.0105	0.001	0.001
2,5-Dimethylhexane	I8	0.0014	0.0086	0.001	0.001
2,4-Dimethylhexane	I8	0.0012	0.0074	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0012	0.0073	0.001	0.001
3,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0027	0.0134	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0011	0.0068	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0062	0.0380	0.003	0.003
4-Methylheptane	I8	0.0018	0.0111	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0040	0.0246	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0067	0.0404	0.003	0.003
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0026	0.0157	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0010	0.0060	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0021	0.0127	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
UnknownC7s	U7	0.0254	0.1368	0.012	0.012
n-Octane	P8	0.0129	0.0792	0.007	0.007
1c,4-Dimethylcyclohexane	N8	0.0011	0.0066	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0004	0.0027	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0016	0.0109	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0006	0.0041	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0018	0.0109	0.001	0.001
n-Propylcyclopentane	N8	0.0007	0.0042	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0006	0.0041	0.000	0.000
2,5-Dimethylheptane	I9	0.0008	0.0055	0.000	0.000
3,3-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0005	0.0029	0.000	0.000

1,3-Dimethylbenzene (m-Xylene)	A8	0.0010	0.0057	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0002	0.0011	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0005	0.0034	0.000	0.000
2-Methyloctane	I9	0.0009	0.0062	0.001	0.001
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0008	0.0054	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0004	0.0027	0.000	0.000
UnknownC8s	U8	0.0002	0.0012	0.000	0.000
n-Nonane	P9	0.0035	0.0241	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0013	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0005	0.0032	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0002	0.0015	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0005	0.0034	0.000	0.000
n-Decane	P10	0.0012	0.0092	0.001	0.001
Sec-Butylcyclohexane	A10	0.0001	0.0008	0.000	0.000
3-Ethylnonane	I10	0.0002	0.0017	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0011	0.0084	0.001	0.001
n-Undecane	P11	0.0007	0.0059	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0001	0.0009	0.000	0.000
Naphthalene	A10	0.0001	0.0007	0.000	0.000
UnknownC11s	U11	0.0002	0.0017	0.000	0.000
n-Dodecane	P12	0.0005	0.0046	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,4-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
2-Methylnaphthalene	A11	0.0002	0.0015	0.000	0.000
n-Tridecane	P13	0.0003	0.0030	0.000	0.000
UnknownC13s	U13	0.0004	0.0040	0.000	0.000
n-Tetradecane	P14	0.0002	0.0022	0.000	0.000
UnknownC14s	U14	0.0009	0.0096	0.001	0.001
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
UnknownC15s	U15	0.0001	0.0011	0.000	0.000
UnknownC16s	U16	0.0001	0.0012	0.000	0.000
UnknownC17s	U17	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	2.9107	2.9261

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0037	0.0155	LHV NET DRY REAL :	1027.5 /scf	1033.1 /scf
TOLUENE	0.0027	0.0134	NET WET REAL :	1009.5 /scf	1015.1 /scf
ETHYLBENZENE	0.0005	0.0029	HHV GROSS DRY REAL :	1136.4 /scf	1142.6 /scf
XYLENES	0.0013	0.0074	GROSS WET REAL :	1116.5 /scf	1122.7 /scf
TOTAL BTEX	0.0082	0.0392	NET HEATING VALUE (60 °F ideal reaction):		20987.8 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23209.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6417
			DENSITY		0.04904 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1419.2

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)
Mod ASTM D6730, GPA 2261 & GPA 2286.

** (CALC: GPA 2172, GPA 2145 & TP-17 @14,696 & 60 F)

C6+ Fraction of DHA Gas Analysis @60°F, 14.696 psia

Net Dry Ideal BTU	<u>4867.5</u> /scf	Relative Density - SG (Air=1)	<u>3.3304</u>	C6+ factors
Gross Dry Ideal BTU	<u>5242.8</u> /scf	Z Compressibility Factor	<u>0.99277</u>	<u>0.99201</u>
Net Dry Ideal BTU	<u>19351.3</u> /lb	Density Factor	<u>254.185</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20841.8</u> /lb	Molar Mass or MW	<u>96.461</u> g/mol	
		Volume Liquid Ideal gas	<u>0.197</u> scf/gal	<u>23</u>

This hexanes plus fraction may be applied in place of published C6+ factors. The Z & GPM need additional calc for C6+ factors.
#DIV/0 or 0 (zero) will appear in this section when there is no hexanes plus in the sample to calculate C6+ factors.

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